

REMARKS

Claims 1-5 are pending in the application. Claim 2 is cancelled.

Claims 1 and 5 have been amended in order to more particularly point out, and distinctly claim the subject matter to which the applicant regards as his invention. It is believed that this Amendment is fully responsive to the Office Action dated **August 5, 2002**.

Claim Rejections under 35 USC §102

Claims 1 and 2 are rejected under 35 USC §102(e) as being anticipated by Hardesty et al. (U.S. Patent No. 6,138,056).

Hardesty et al. (USP'056) describes a process by which a computer measures and analyzes machine operation. First, the time for traveling a certain distance is recorded and stored in a file along with the distance traveled. Stored in the program is appropriate information pertaining to different aspects of the machine operation, such as the time required to travel a certain distance. If the travel time is greater than the time stored in the reference value storage section, then maintenance is required. If maintenance work is required, this is indicated on a display.

However, USP '056 does not disclose the maintenance system set forth in amended claim 1. The maintenance system set forth in amended claim 1 comprises the sensor including at least one of a rotation sensor for detecting the number of rotations of the main spindle, a temperature sensor for detecting the temperature of the machine tool, an acceleration sensor for detecting the acceleration acting on the machine tool, a displacement sensor for detecting displacement of a predetermined portion of the machine tool, and a noise meter for detecting noise caused by the machine tool, and a

judgement section for evaluating the static and/or dynamic characteristics of the machine tool on the basis of a detection signal detected by the sensor and the reference values stored in the reference value storage section for judging the acceptability of the characteristics.

Thus, according to the maintenance system set forth in amended claim 1, the static and/or dynamic characteristics of a machine tool, such as the rotation accuracy of the main spindle, the temperature increase characteristic of the structure of the machine tool, the thermal displacement characteristic in accordance with the temperature increase, the vibration characteristic of the structure, and the noise characteristic caused by vibration can be evaluated and judged directly and automatically.

Hardesty et al. does not describe the above temperature sensor, acceleration sensor, displacement sensor and noise meter. Therefore, the maintenance system disclosed in USP'056 can not evaluate and judge the static and/or dynamic characteristics of a machine tool, such as the rotation accuracy of the main spindle, the temperature increase characteristic of the structure of the machine tool, the thermal displacement characteristic in accordance with the temperature increase, the vibration characteristic of the structure and the noise characteristic caused by vibration.

Specifically, amended claim 1 patentably distinguishes over the prior art relied upon by reciting,

“A machine tool maintenance system for evaluating and controlling the static and/or dynamic characteristics of a machine tool having a main spindle unit and a feeder in trial operation of the machine tool, the machine tool maintenance system comprising: a sensor for detecting the static and/or dynamic characteristics of the machine tool; a reference value storage section for storing predetermined reference values indicative of standard conditions of the machine tool; a judgement section for evaluating the static and/or dynamic characteristics of the machine tool on the basis

of a detection signal detected by the sensor and the reference values stored in the reference value storage section for judgement on the acceptability of the characteristics; and an output device for outputting a judgement result obtained by the judgement section, wherein the sensor includes at least one of a rotation sensor for detecting the number of rotations of the main spindle, temperature sensor for detecting the temperature of the machine tool, acceleration sensor for detecting the acceleration acting on the machine tool, displacement sensor for detecting displacement of a predetermined portion of the machine tool, and a noise meter for detecting noise caused by the machine tool." (Emphasis Added)

Therefore, withdrawal of the rejection of claim 1 under 35 USC §102(e) as being anticipated by Hardesty et al. (U.S. Patent No. 6,138,056) is respectfully requested.

Claim Rejections under 35 USC §103

Claims 3 and 4 are rejected under 35 USC §103(a) as being unpatentable over Hardesty et al. in view of Love et al. (U.S. Patent No. 5,629,871).

Love et al. describes a dialysis machine and does not describe the sensors and elements recited in amended independent claim 1. Therefore, claims 3 and 4 are allowable by virtue of their dependence upon an allowable independent claim.

Therefore, withdrawal of the rejection of claims 3 and 4 under 35 USC §103(a) as being unpatentable over Hardesty et al. in view of Love et al. (U.S. Patent No. 5,629,871) is respectfully requested.

Claim 5 is rejected under 35 USC §103(a) as being unpatentable over Hardesty et al. in view of Love et al. and Saito (U.S. Patent No. 4,644,426) and Ruh (U.S. Patent No. 4,458,893).

Saito (U.S. Patent No. 4,644,426) is directed to a floppy disc drive apparatus and Ruh (U.S. Patent No. 4,458,893) is directed to a sheet feeder. These teachings do not cure the defects of the Hardesty et al. reference. Claim 5 is dependent upon an allowable independent claim. Therefore, withdrawal of the rejection of claim 5 under 35 USC §103(a) as being unpatentable over Hardesty et al. in view of Love et al. and Saito (U.S. Patent No. 4,644,426) and Ruh (U.S. Patent No. 4,458,893) is respectfully requested.

Conclusion

In view of the aforementioned amendments and accompanying remarks, claims 1 and 5, as amended, are believed to be in condition for allowance, which action, at an early date, is requested.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicant's undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "**Version with markings to show changes made.**"

In the event that this paper is not timely filed, Applicant respectfully petitions for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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PATENT TRADEMARK OFFICE

Enclosures: Version with markings to show changes made

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IN THE CLAIMS:

Please amend claims 1 and 5 as follows:

1. (Amended) A machine tool maintenance system for evaluating and controlling the static and/or dynamic characteristics of a machine tool having a main spindle unit and a feeder in trial operation of the machine tool, the machine tool maintenance system comprising:

a sensor for detecting the static and/or dynamic characteristics of the machine tool;

a reference value storage section for storing predetermined reference values indicative of standard conditions of the machine tool;

a judgement section for evaluating the static and/or dynamic characteristics of the machine tool on the basis of a detection signal detected by the sensor and the reference values stored in the reference value storage section for judgement on the acceptability of the characteristics; and

an output device for outputting a judgement result obtained by the judgement section,

wherein the sensor includes at least one of a rotation sensor for detecting the number of rotations of the main spindle, temperature sensor for detecting the temperature of the machine tool, acceleration sensor for detecting the acceleration acting on the machine tool, displacement sensor for detecting displacement of a predetermined portion of the machine tool, and a noise meter for detecting noise caused by the machine tool.

5. (Amended) A machine tool maintenance system according to [any one of Claims 1 through 4] Claim 1, 3, or 4, further comprising a drive signal generator which generates a drive

control signal to operate the main spindle unit and/or feeder for a trial and transmits the generated drive control signal to the machine tool.